

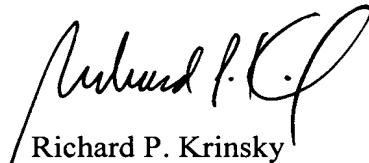
REMARKS

This Preliminary Amendment is to clarify portions of the Application, including the Specification and Claims, to add new Claims and a new Abstract of the Disclosure, and to amend the Drawings. Also included is a Substitute Specification and, for convenience, a marked-up copy of the Substitute Specification showing the changes made. The Application is an English-translation of the International Application. No new matter has been added.

The Application is now in condition for allowance, and such is respectfully requested.

It is respectfully requested that, if necessary to effect a timely response, this paper be considered as a Petition for an Extension of Time sufficient to effect a timely response and shortages in other fees, be charged, or any overpayment in fees be credited, to the Account of Barnes & Thornburg LLP, Deposit Account No. 02-1010 (677/43982).

Respectfully submitted,



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WO 2004/054719 PCT/EP2003/014253

~~CENTRIFUGE, PARTICULARLY A SEPARATOR, HAVING SOLIDS
DISCHARGE NOZZLES AND WEAR PROTECTION~~

BACKGROUND

[0001] The ~~invention~~ present disclosure relates to a centrifuge, particularly or a separator, comprising a centrifugal basket, or centrifugal drum, having a basket shell or drum shell, which is provided with solids discharge nozzles.

[0002] A separator of this type is known from U.S. Patent Document US 3,108,952. In the exterior wall of the centrifugal basket of this separator, solids discharge nozzles are arranged in a mutually angularly offset manner in the area of the largest inside diameter of the centrifugal basket. In this case, nozzle bodies are inserted into bores of the basket shell, which nozzle bodies do not extend radially toward the outside but are oriented in an inclined manner with respect to the respective radial direction in order to utilize the acceleration effect of the product phase exiting from the nozzles, which reduces the power required for rotating the centrifugal basket.

[0003] Since the discharge nozzles are arranged in an inclined manner with respect to the radial direction, the product jet exiting from the discharge nozzles can at least, by means of a certain portion, impact on the exterior wall of the basket or collide with it, which may cause considerable wear of the exterior wall of the basket.

[0004] A similar state of the art is illustrated in U.S. Patent Document US 2,695,748. The discharge nozzles illustrated in this document each consist of a first sleeve with a bore extending centrically through the sleeve from the inside radially to the outside. The first sleeves are inserted into the bores of the basket shell. A second sleeve is in each case screwed into them in their end area at an angle with respect to the radial direction, which second sleeve also has a centric bore, so that the product phase exiting from the centrifugal basket is first guided through the first sleeve radially toward the outside and is then guided through the second sleeve from which ~~it~~ the product phase exits in an inclined manner with respect to the radial direction against the rotating direction of the separator.

[0005] From Figure 9 of U.S. Patent Document US 2,695,748 of the above-mentioned type, it is also known to insert the first sleeve at an angle with respect to the radial direction in a bore of the basket wall. In this case, at its outer end, the sleeve ends approximately flush with the exterior side of the centrifugal basket, which has the effect that, behind the outlet of the sleeve with the nozzle, the product flow in a recess of the centrifugal basket can impact against the basket shell and can wear out the latter. In practice, the wear results in deep grooves in the basket wall which finally result in expensive maintenance work. For fixing the first sleeve on the centrifugal basket, a projection is used which locks into a groove of the centrifugal basket.

[0006] With respect to the state of the art, German Patent Documents DE 11 30 371 B, DE 199 51 663 A, DE 41 05 412 A, DE 18 61 982 U, ~~DE 18 61 982 U~~, DD 42343 and U.S. Patent Document 20 60 239 are also mentioned which, however, are not as close to the invention.

[0007] German Patent Document DE 18 61 982 relates to a centrifugal sieve basket with perforations for implementing the sieve function which are filled by hard-metal spouts, the shell of the basket being covered with hard metal.

[0008] From German Patent Document DE 41 05 412 A, a solid shell worm-type centrifuge is known in the case of which bores in the basket are lined on the inside with a hard metal for the discharge of solids.

SUMMARY

[0009] It is an object of the invention The present disclosure relates to a way to protect the a separator of the above-mentioned type in a simple manner better than in the prior art against a-wear caused by the product phase exiting from the solids nozzles.

[00010] The invention solves this task by means of the object of Claim 1. Accordingly, at least one wear protection device respectively is in each case arranged and/or constructed on the basket shell in the area of the solids discharge nozzles, which wear protection device reduces the wear in a simple manner. present disclosure relates to a separator, including a drum shell having at least one solids discharge nozzle and at least one wear protection element on the drum shell in an area of and behind the at least one solids discharge nozzle.

[00011] According to a variant, the wear protection devices are constructed as wear protection elements. Separatean embodiment of the present disclosure, separate elements permit an optimal adaptation to the a task of the wear protection.

[00012] According to another variantan embodiment of the present disclosure, the wear protection devices are constructed as coatings, particularly such as of a ramp, in the basket or drum shell. This variant representsembodiment may be an effective and, under certain circumstances, a lower-cost alternative to the separate wear protection elements.

[00013] The wear protection devices preferablyconsist of may include a wear-resistant material, such as steel or a hard metal or a ceramic material or a combination or a composite of these materials, or they are coated with such a material.

[00014] The discharge nozzles are preferablymay be provided with discharge openings oriented at an angle $\alpha + \beta$ in an inclined manner with respect to the a radial direction R , and the. The angle $\alpha + \beta$ between the radial direction R in the area of the discharge nozzles and the orientation of the discharge openings is preferablymay be equal to or smaller than 90° (for example, between 70 and 85°). Since, specifically in the case of separators with such discharge nozzles, high wear of the basket or drum shell occursmay occur locally, the wear protection elements are particularly advantageous heremay be helpful. In this case, the An orientation angle of the discharge openings with respect to the radial direction [f]R[I] particularly preferably amounts tomay be between 70 and 90° .

[00015] The invention is suitable mainly forpresent disclosure generally relates to separators whose centrifugal basket or drum has a vertical axis of rotation and has a single or double conical construction, the. The solids discharge nozzles preferablygenerally are being arranged in the an area of the largest diameter of the centrifugal basket, particularly or drum, and the nozzles beingare inserted in the latter drum from the outside.

[00016] Particularly advantageously, the invention can be used in the case of The present disclosure relates to separators whose discharge openings are arranged offset toward the interior by a distance relative to the largest outer periphery or outside diameter of the centrifugal basket or drum and which each have a recess as an extension of the discharge openings in the basket or drum shell, which receive the wear protection elements.

[00017] In a particularly preferable manner, the The wear protection elements may extend from the discharge openings to the outer edge of the basket or drum shell in order to

protect specifically the latter drum shell area of the centrifugal basket drum which, according to the state of the art, is particularly may be stressed.

[00018] In the following, embodiments will be described in detail by means of the drawing also illustrating additional advantages of the invention. Other aspects of the present disclosure will become apparent from the following descriptions when considered in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[00019] Figures Figure 1a, b are a sectional side view of a section of the an exterior wall of a centrifugal basket drum shell of an embodiment of a separator in the an area of a solids discharge nozzle and a top view of the area of the solids discharge nozzle; according to the present disclosure.

[00020] Figure 1b is a top view of an area of the solids discharge nozzle shown in Figure 1a.

[00021] Figures Figure 2a, b are two different views is a side view of the wear protection elements of the separator of Figure 1; element shown in Figures 1a and 1b.

[00022] Figure 2b is an elevational view of the wear protection element shown in Figure 2a.

[00023] Figures 3a, b are analogous representations of a section of a second separator; Figure 3a is a side view of an exterior wall of a centrifugal drum shell of another embodiment of a separator in an area of a solids discharge nozzle, according to the present disclosure.

[00024] Figure 3b is a top view of an area of the solids discharge opening shown in Figure 3a.

[00025] Figure 4 contains two different views of the wear protection elements of the separator of Figure 3; Figure 4a is a side view of the wear protection element shown in Figures 3a and 3b.

[00026] Figures 5 a, b, c are representations analogous to Figures 1 and 2 of a section of a third separator; Figure 4b is an elevational view of the wear protection element shown in Figure 4a.

[00027] Figures 6 a, b, c are representations analogous to Figure(s) 1 and of a section of a fourth separator; and Figure 5a is a side view of an exterior wall of a centrifugal drum

shell of another embodiment of a separator in an area of a solids discharge nozzle,
according to the present disclosure.

[00028] Figures 7 a, b, c and 8 are representations analogous to Figures 1 and 2 of a section of a fifth and sixth separator; Figure 5b is a top view of an area of the solids discharge nozzle shown in Figure 5a.

[00029] Figure 5c is a side view of the wear protection element shown in Figures 5a and 5b.

[00030] Figure 5d is an elevational view of the wear protection element shown in Figure 5c.

[00031] Figure 6a is a side view of an exterior wall of a centrifugal drum shell of another embodiment of a separator in an area of a solids discharge nozzle, according to the present disclosure.

[00032] Figure 6b is a top view of an area of the solids discharge nozzle shown in Figure 6a.

[00033] Figure 6c is a side view of the wear protection element shown in Figures 6a and 6b.

[00034] Figure 6d is an elevational view of the wear protection element shown in Figure 6c.

[00035] Figure 7a is a side view of an exterior wall of a centrifugal drum shell of another embodiment of a separator in an area of a solids discharge nozzle, according to the present disclosure.

[00036] Figure 7b is top view of an area of the solids discharge nozzle shown in Figure 7a.

[00037] Figure 8a is a side view of an exterior wall of a centrifugal drum shell of another embodiment of a separator in an area of a solids discharge nozzle, according to the present disclosure.

[00038] Figure 8b is a top view of an area of the solids discharge nozzle shown in Figure 8a.

[00039] Figure 9 is a perspective view of a separator basket; and drum, according to the present disclosure.

[00040] Figure 10 is a lateral view of a section of the separator basket-drum of Figure 9.

DETAILED DESCRIPTION

[00041] Figure 1a illustrates a portion of a sectional view of the an outer wall of a basket shell or drum shell 1 of a centrifugal basket or drum 28 (see, for example, Figure 9) of a separator with a perpendicular having an axis of rotation V that is vertically oriented and, which, for example, has a single-cone or double-cone geometry, which. The drum shell 1 is equipped with at least one, preferable and possibly more discharge nozzles 2 for solids.

[00042] The discharge nozzles 2 are formed of include a sleeve body 3 and are each inserted, [[{}]] for example, screwed [[>]] in the a radial direction R of the centrifugal basket drum into bores 4 in the basket drum shell 1 which, in this case, The bores 4 also extend in the radial direction R. On their outer periphery, the discharge nozzles 2 have sealing rings 22. Here, the basket The drum shell 1 has recesses 21 on the an inside in each case in front of the discharge nozzles 2, which recesses 21 taper in the a direction of the discharge nozzles 2 and guide the solids to the discharge nozzles 2.

[00043] The discharge nozzles 2 are each provided with include a centric bore 7 which extends from the an interior space 5 of the basket drum shell 1 in the a direction of the exterior space 6 of the basket and which drum shell 1. The center bore 7 extends in a first bore section 8 with having a first diameter D1 in the radial direction R from the an interior to the an exterior of the drum shell 1 or drum 28 (see Figure 9) and then changes to a bore section 9 which is oriented at an angle with respect to the first bore section 8 and has a smaller diameter D2 relative to the first diameter D1.

[00044] In this manner, the A discharge opening 10 of the bore section 9 is in each case oriented at an angle, for example, $\alpha + \beta$. with respect to the radial direction R, the. The angle $\alpha + \beta$ between the radial direction R and the discharge opening 10 or the second bore area 9 preferably being is equal to or smaller than 90° . In particular, it amounts to and may be, for example, between 70 and 90° .

[00045] Since, on the outside of drum shell 1, the sleeve bodies 3 end essentially flush with the an outer edge or wall of the basket drum shell 1, the discharge opening 10 is in each case offset toward the interior by a distance a relative to the largest outer periphery or outside diameter of the centrifugal basket drum 28 (see Figure 9) or of the basket drum shell 1.

[00046] Correspondingly, as an extension of the second bore section 9, a channel-type indentation or recess 11, which is constructed at an angle with respect to the radial direction R, has to be is constructed in the basket drum shell 1, so that the a product phase or solids exiting from the discharge nozzles 2 sprays as completely as possible on the outside past the basket drum shell 1.

[00047] However, in the case of this construction, it should be noted that a portion of the solids exiting from the discharge nozzle nozzles 2 imparts may impact on the basket drum shell 1 and causes may cause wear of the basket drum shell 1, particularly in the an exterior area of the recess 11 as well as also farther in the a peripheral direction.

[00048] In order to To possibly reduce or even possibly avoid this wearing effect, it is provided to insert on the above-noted wear on the drum shell 1, a wear protection element 12 respectively is inserted into the recesses 11, which is. The recesses 11 are constructed separately from the discharge nozzles openings 10 and preferably extends may extend from the discharge openings 10 or from shortly behind the discharge openings 10 to the outer periphery of the basket drum shell 1 or beyond.

[00049] In an advantageous and easily producible manner, the The wear protection elements 12 are constructed as plate-type bodies which, on. On the a side which is on the an exterior in the mounted position, are each themselves provided with a type of each wear protection element includes a groove or channel 13 which, in the a mounted position of as shown, for example, in Figures 1 and 2, points toward the outside and is advantageously used as a guiding or discharge channel for the product phase exiting from the centrifugal basket drum 1 at an angle $\alpha + \beta$ with respect to the radial direction R.

[00050] The centrifugal basket drum is protected against wear by means of the wear protection elements 12 in the area of the recess 11 in a simple and nevertheless effective manner.

[00051] The mounting of the wear protection elements 12 on the basket drum shell 1 can take place by means of screws 14 and/or mutually corresponding groove and tongue elements between the basket drum shell 1 and the wear protection elements 12. Thus, it becomes possible to provide the wear protection element elements 12 with a type of base plate 17 molded on in one piece, whose exterior edges can be pushed as tongues 15, 16

into two mutually opposite channels (outlined in Figure 1b in a broken line), as suggested by broken lines in Figures 1a and 1b, in the a lateral base area of the recess 11.

[00052] The wear protection elements 12 can thereby easily be exchanged in the event of damage or wear. In this manner, under certain circumstances, the service life of the centrifugal basket per se and drum may also be increased. As special advantages, their easy handling and their basic suitability. The wear protection elements 12 are easily handled and are suitable for retrofitting on existing centrifugal baskets should also be stressed drums.

[00053] The A base of the semicylindrical channel 13 is offset by a distance b (in Figure 1, it corresponds to the distance x) toward the a rear with respect to the discharge opening 10 of the discharge nozzle 11. In this case, the As shown in Figure 1b, distance b corresponds to distance x channel. Channel 13 can completely or in sections be oriented parallel or at an angle, which is smaller than 30°, particularly smaller than 20°, with respect to the second bore section 9 or with respect to the discharge opening 10. The angle may be smaller than 30° and may even be smaller than 20°.

[00054] A first area 18 of the channel 13 preferably adjoins the discharge opening 10 parallel to the second bore section 9, whose orientation is at an angle $\alpha + \beta$, as shown in Figure 1b. The angle $\alpha + \beta$ may be smaller than 90° (here, shown as approximately 80°, preferably and may be between 70 and 85°[[;]]). The angle $\alpha + \beta$ is inclined with respect to the radial direction R and may also defines define the discharge angle of the product phase from the centrifugal basket; and a drum. A second area 19 is oriented slightly farther toward the radial direction R (see angle β), so that, in the an end area of the channel 13, a type of ramp 20, possibly acting as a break edge or edges, is created which has a maximal height x over the a base of the channel 13, which directs the a portion of the product flow impacting here slightly farther radially toward the outside and in this manner has a slight braking effect on this portion of the product flow, which may be advantageous in have a positive effect on the operation of the separator.

[00055] The wear protection elements 12 are suitable for use with sleeve bodies 3 of the type of Figure 1 as shown in Figure 1b and which sleeve bodies 3, in the an interior, close off flush with the an interior side of the basket drum shell 1[[;]]. The wear protection elements 12 are compatible as well as for sleeve bodies 3 which, in the manner of as

shown in Figure 3b. The sleeve bodies 3, project slightly into the interior of the centrifugal basket drum shell 1[[;]] so that deposits can form around the sleeve bodies 3 which, in the case a processing of certain products, may have an advantageous positive effect on the such product processing.

[00056] In Figures 1 and 3As suggested in Figures 1a, 1b, 3a and 3b, the wear protection elements 12 extend from the discharge openings 10 to the an outer edge of the recesses 11, so that the an entire area of the recesses 11 is protected against wear.

[00057] As break edgesAs shown in Figures 1b and 3b, the ramps 20, acting as break edges, extend in the a longitudinal direction of the channel 13 over less than half its length, particularly for example, over a distance of up to 20 mm, according to a preferred variant, even only and conceivably over a distance of from 1 to 5 mm. The height x (here, in Figure 1, x = b), shown in Figure 1b as x = b, of these break edges or of the ramps preferably also amounts to may be 1 - 10 mm. With respect to the a precise dimensioningheight, it is recommended that the influence of themay be determined at least partly by a diameter of the basket be taken into accountdrum.

[00058] The base of the channel 13 is preferably may be situated closely below the discharge opening 10. The A distance between the discharge opening 10 and the base of the channel 13[[;]], as well as their diameter diameters, may influence the type and manner of the product flow discharge. In Figure 3b, the height x is clearly lowerless than the distance b, so that the solids may partially flow directly over the an edge of the ramp 20. In addition, the length of the wear protection elements 2012 in the a peripheral direction is also shorter than the wear protection elements 12 shown in Figure 1b.

[00059] The geometry of the a transition between the ramp 20 and the remaining a remainder of channel 13 may be curved or abrupt. It may also follow the geometry of a trigonometric or exponential function. Preferably, the An inclination of the ramp 20 with respect to the a discharge direction of the solids increases as the ramp 20 moves away from the discharge opening 10.

[00060] As an extension of the channel 13, the geometry of the wear protection elements 12 is adapted to the a curvature of the basket drum shell 1 in order to also ensure a protection here.

[00061] According to the embodiment of Figure 5Figures 5a-d, the ramps 20 project radially toward the outside beyond the an outer periphery or the largest diameter of the centrifugal basketdrum shell 1, which. Ramp 20 guides the product flow still farther toward the outside and contributes to preventing that the latter can come in contact with the basketdrum shell 1. Virtually, a type of To that end, an undercut 23 or an undercut break edge is formed.

[00062] Ramp 20, as shown in Figure 5b, is constructed in the manner of a “ski jump”; that is they have. Ramp 20 has[.]] an angle $\alpha > 0$ with respect to the discharge direction of the product flow from the discharge nozzle 10_2 in a first area 24, and in the. In an adjoining additional area 25, have ramp 20 has a larger angle $\alpha + c$ ($\alpha > 0$; $c > 0$) with respect to the discharge direction of the product flow from the discharge nozzle 32.

[00063] An analogous situation applies to Figure 6Figures 6a-6d. However, here the ramps 20 project still farther beyond the outer periphery of the basketdrum shell 1 or the diameter toward the outside.

[00064] Figure 9 is a perspective view of a centrifuge or separator drum 28 according to the type of Figure 1, for example, the embodiment shown in Figures 1a and 1b. The-A double-cone geometry of the centrifugal basketdrum 28 or of the basketdrum shell 1 with the bores 4 in the an area of the largest diameter or in the an area of the a transition from the a lower conical section to the an upper conical section of the basketdrum shell 1 is particularly visible, the. The discharge nozzles 2 or the sleeve bodies 3 having an external thread, so that they can be screwed from the outside into the bores 4 with a corresponding internal thread. The separately constructed wear protection elements 12 with their groove or channel 13 are also easily recognizable. One of the wear protection elements respectively iselement 12 may be provided behind each discharge nozzle 2 in the rotating direction. Figure 10 isshows a corresponding lateral view of the centrifugal basketor ofdrum 28 and the basketdrum shell 1.

[00065] According to Figures 7 and 8,The embodiments shown in Figures 7a, 6, 8a and 8b show no wear protection element 12 is constructed on the basketdrum shell 1. Instead, a type of ramp 26 is constructed at the base of the recess 11 in the basketdrum shell 1 itself so that the product flow is directed farther radially toward the outside. This also reduces the may also reduce a wear problem because at least the entire basketdrum shell 1 is no

~~longer not detrimentally affected. The ramp 26 is preferably may be coated with a wear protection alloy [f] for example, with a hard metal or a titanium alloy [g].~~

[00066] ~~In Figures 7 and 8, the measure of Figure 7 is also promoted in that the In Figures 7b and 8b, nozzle or sleeve body 3 itself projects in a ramp-type manner beyond the an outer periphery of the basket drum shell 1 toward the outside and forms a type of ramp 27, so that, during the an operation, it itself ramp 27 provides a certain deflection of the product flow discharged from the respective preceding nozzle or sleeve body 3.~~

[00067] ~~Although the variants of Figures 7 and 8 do not offer a wear protection which is as optimal as that of the variants of the preceding figures, they can be implemented in a more favorable manner. While the two embodiments of Figures 7a, 7b, 8a and 8b do not include the same type of wear protection, for example, wear protection elements 12, these two embodiments do have favorable wear protection as described in the paragraphs above.~~

[00068] ~~Although the present disclosure has been described and illustrated in detail, it is to be clearly understood that this is done by way of illustration and example only and is not to be taken by way of limitation. The scope of the present disclosure is to be limited only by the terms of the appended claims.~~

[00069] Reference Symbols

Basket shell	1
discharge nozzles	2
sleeve body	3
bores	4
basket interior	5
basket exterior	6
bore	7
bore sections	8,9
discharge opening	10
recess	11
wear protection elements	12
groove	13
screws	14
tongues	15, 16
base plate	17
areas	18,19
ramp	20
recesses	21
sealing rings	22
undercut	23
areas	24,25
ramps	26,27
basket	28
diameter	D1, D2
radial direction	R
distance	a,b,x
angle	á,â,e

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CLAIM SUMMARY DOCUMENT

WO 2004/054719

PCT/EP2003/014253

CLAIMS WE CLAIM:

1. (Currently Amended) Separator, comprising a centrifugal basket (28) having a basket shell (1) which is provided with at least one or more solids discharge nozzles (2), characterized in that

in each case at least one wear protection device is arranged and/or constructed on the basket shell (1) in the area of the solids discharge nozzles (12),

the wear protection devices being constructed as wear protection elements (12), and

viewed against the rotating direction, one of the wear protection elements (12) being arranged behind each discharge nozzle (2). A separator comprising:

a centrifugal drum including a drum shell having at least one solids discharge nozzle; and

at least one wear protection element on the drum shell in an area of and behind the at least one solids discharge nozzle.

2. (Currently Amended) Separator, The separator according to Claim 1, wherein characterized in that the centrifugal basket (28) drum has a vertical axis of rotation and at least one of the following: a) a single-cone or and b) a double-cone construction.

3. (Currently Amended) Separator, The separator according to Claim 1 or 2, characterized in that, wherein the at least one solids discharge nozzles (2) in the nozzle is located in an area of the largest diameter of the centrifugal basket (19) are drum and is inserted into the latter centrifugal drum from the an outside of the centrifugal drum.

4. (Currently Amended) Separator, The separator according to one of the preceding claims, characterized in that Claim 1, wherein the at least one wear protection device is constructed as a ramp (26) in the basket drum shell.

5. (Currently Amended) Separator ~~The separator according to one of the preceding claims, characterized in that Claim 1, wherein the at least one wear protection devices (12) consist of~~ element is made of a wear-resistant material, such as that includes one or more of the following: a) steel or, b) a hard metal or, c) a ceramic material or of and d) a combination or a composite of these materials, or are coated with such a material of one or more of a), b), c) and d).

6. (Currently Amended) Separator ~~The separator according to one of the preceding claims, characterized in that~~ Claim 1, wherein the at least one discharge nozzles (2) have nozzle includes a discharge openings (10) opening oriented at an angle ($\alpha + \beta$) inclined with respect to the a radial direction (R), and in that the angle ($\alpha + \beta$) between the radial direction (R) in the area of the at least one discharge nozzles nozzle and the an orientation of the discharge openings (10) opening, is preferably equal to or smaller than 90°.

7. (Currently Amended) Separator ~~The separator according to one of the preceding claims, characterized in that~~ Claim 6, wherein the orientation angle ($\alpha + \beta$) of the discharge openings (10) with respect to the radial direction (R) is between 70 and 85°.

8. (Currently Amended) Separator ~~The separator according to one of the preceding claims, characterized in that~~ Claim 6, wherein the discharge openings (10) are opening is arranged at an offset distance from an outer periphery of the drum shell toward the an interior by a distance (X) relative to the largest outer periphery or outside diameter of the centrifugal basket (28), and in that one recess (11) respectively is constructed as an extension of the discharge openings (10) in the basket shell (1), which receive the wear protection elements (12) of the centrifugal drum.

9. (Currently Amended) Separator ~~The separator according to one of the preceding claims, characterized in that~~ Claim 8, wherein the at least one wear protection elements (12) extend element extends from the discharge openings (10) opening to the outer edge periphery of the basket drum shell (1).

10. (Currently Amended) Separator The separator according to one of the preceding claims, characterized in that Claim 1, wherein the at least one wear protection elements (12) are element is constructed as a plate-type bodies which are provided on their exterior side with a groove, particularly body having a channel (13), which are used configured as a discharge channel for a product phase exiting from the centrifugal basket (28) drum at an angle ($\alpha + \beta$) inclined with respect to the a radial direction, the angle being between the radial direction in the area of the at least one discharge nozzle and an orientation of a discharge opening of the at least one discharge nozzle.

11. (Currently Amended) Separator The separator according to one of the preceding claims, characterized in that Claim 1, wherein the at least one wear protection elements (12) are element is fastened to the basket drum shell (1) by means of at least one of the following: a) screws (14) and/or and b) mutually corresponding groove and tongue elements (15, 16) between the basket drum shell (1) and the at least one wear protection element (12).

12. (Currently Amended) Separator The separator according to one of the preceding claims, characterized in that Claim 28, wherein the at least one wear protection elements (12) are equipped with element includes a base plate (17) whose outer edges, as having tongues (16), canas outer edges, the tongues configured to be pushed into two mutually opposite grooves (15) in the a lateral base area of the recess (11).

13. (Currently Amended) Separator The separator according to one of the preceding claims, characterized in that the Claim 10, wherein a base of the channel (13) is situated by-at a distance (b) offset from an outer periphery of the drum shell toward the an interior of the centrifugal drum with respect to the a discharge opening (10) of the at least one discharge nozzle (2) in the basket drum shell, and in that the channel (13) is oriented one of a) completely or-and b) in sections, the sections being one of a) parallel or-and b) at an angle smaller than 30°, particularly smaller than 20°, with respect to the a discharge opening (10) of the at least one discharge nozzle.

14. (Currently Amended) Separator ~~The separator according to one of the preceding claims, characterized in that~~ Claim 10, wherein the channel (13) changes transitions into a ramp (20).

15. (Currently Amended) Separator ~~The separator according to one of the preceding claims, characterized in that~~ Claim 10, wherein a first area (18) of the channel (13) adjoins ~~the~~ a discharge opening (10) of the at least one discharge nozzle, the first area being parallel to ~~a~~ the second bore section (9), and in that a second area (19) of the channel (13) is inclined farther toward the radial direction.

16. (Currently Amended) Separator ~~The separator according to one of the preceding claims, characterized in that~~ Claim 1, further including a sleeve bodies (3) body as part of the at least one discharge nozzle, the sleeve body configured to close off flush with the ~~an~~ interior side of the basket drum shell (1).

17. (Currently Amended) Separator ~~The separator according to one of the preceding claims, characterized in that~~ Claim 16, wherein the sleeve bodies (3) project body projects slightly into the ~~an~~ interior of the centrifugal basket (28) drum.

18. (Currently Amended) Separator ~~The separator according to one of the preceding claims, characterized in that, as~~ Claim 14, wherein the ramp, acting as a break edges, the ramps (20) extend in the edge, extends in a longitudinal direction of the channel (13) over a distance of less than half its a length, particularly over a path of up to 10 mm, preferably over of the channel, such distance being 1 to 10 mm.

19. (Currently Amended) Separator ~~The separator according to one of the preceding claims, characterized in that~~ Claim 14, wherein a geometry of the transition between the ramp and the channel (13) is at least one of the following: a) curved or and b) abrupt.

20. (Currently Amended) Separator The separator according to one of the preceding claims, characterized in that the Claim 14, wherein a geometry of the transition between the ramp (20, 26) and the channel (13) follows the geometry of is at least one of the following: a) a circle or and b) an exponential function.

21. (Currently Amended) Separator The separator according to one of the preceding claims, characterized in that the Claim 14, wherein an inclination of the ramp (20, 26) with respect to the discharge opening of the solids-increases in a direction away from the discharge opening (10).

22. (Currently Amended) Separator The separator according to one of the preceding claims, characterized in that the sleeve bodies (3) are each Claim 16, wherein the sleeve body is inserted in the radial direction of the centrifugal basket drum into a radially extending bores (4) bore of the basket drum shell (1).

23. (Currently Amended) Separator The separator according to one of the preceding claims, characterized in that Claim 16, wherein the sleeve bodies (13) have body includes a bore (7) extending from the an interior basket drum space (5) to the an exterior basket drum space (6) and, which extend sleeve body extends in a first bore section (8) with having a first diameter D1 in the radial direction from the interior space to the exterior space and then change the first bore section changes into a second bore section (9) which is oriented at an angle with respect to the first bore section (8) and has a smaller second diameter D2 relative to the first diameter.

24. (Currently Amended) Separator The separator according to one of the preceding claims, characterized in that the Claim 10, wherein a geometry of the at least one wear protection elements (12) element, as an extension of the channel, (13) is adapted to the a curvature of the basket drum shell.

25. (Currently Amended) Separator The separator according to one of the preceding claims, characterized in that Claim 14, wherein the ramp of the at least one wear

protection elements, particularly their ramps (20), project projects radially toward the outside beyond the ~~an~~ outer periphery or outside diameter of the basket drum shell (1) of the centrifugal basket (28).

26. (Currently Amended) Separator ~~The separator according to one of the preceding claims, characterized in that~~ Claim 14, wherein the ramp is constructed as an undercut break edge.

27. (Currently Amended) Separator ~~The separator according to one of the preceding claims, characterized in that~~ Claim 1, wherein the at least one wear protection device element is constructed as a ramp (27) at the at least one discharge nozzle body (2), which projects radially toward the outside beyond the basket drum shell.

28. (New) The separator of Claim 6, wherein a recess is constructed as an extension of the discharge opening in the drum shell and the recess is configured to receive the at least one wear protection element.

29. (New) The separator of Claim 13, wherein the angle with respect to the discharge opening is less than 30°.

30. (New) The separator according to Claim 13, wherein the angle with respect to the discharge opening is less than 20°.